

**Draft**  
**Environmental Assessment for the**  
***Ozark Highlands Auto Tour Route***  
**on Mingo National Wildlife Refuge**  
**Puxico, Missouri**

U.S. Department of the Interior  
Fish and Wildlife Service  
Mingo National Wildlife Refuge



DRAFT

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## **1.0 PURPOSE AND NEED FOR ACTION**

### **1.1 Introduction:**

Mingo National Wildlife Refuge (Mingo NWR/refuge) has prepared this Draft Environmental Assessment (EA) to evaluate the effects of allowing public vehicle access on the 15.1 mile Ozark Highlands Auto Tour Route (ATR). This EA complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 CFR 1500-1509) and Department of the Interior (516 DM 8) and U.S. Fish and Wildlife Service (550 FW 3) policies (see Section 1.7 for a list of additional regulations with which this EA complies).

The activities in this document describe the use by the public of the rehabilitated and expanded sections of the ATR and the refuge's ability to provide wildlife dependent public recreational opportunities. It is expected that the improved ATR will be a main attraction to the refuge as it offers prime viewing opportunities for wildlife and scenic views. The ATR will improve and expand the public's understanding of the important role that Mingo NWR provides on a local and landscape scale.

### **1.2 Location:**

The Proposed Action would occur in Stoddard and Wayne Counties, Missouri, within the Mingo Basin on Mingo NWR (see Figure 1).

### **1.3 Background**

Mingo National Wildlife Refuge is managed by the U.S. Fish and Wildlife Service under the Department of the Interior and is a unit of the National Wildlife Refuge System (NWRS).

National Wildlife Refuge System Mission and Goals:

The mission of the National Wildlife Refuge System is (National Wildlife System Administration Act of 1966, as amended [16 U.S.C. 668dd668ee]):

“To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

The National Wildlife Refuge System Improvement Act of 1997 established several important mandates aimed at making the management of national wildlife refuges more cohesive. The preparation of comprehensive conservation plans is one of those mandates. The legislation directs the Secretary of the Interior to ensure that the mission of the National Wildlife Refuge System and purposes of the individual refuges are carried out. It also requires the Secretary to maintain the biological integrity, diversity, and environmental health of the National Wildlife Refuge System.



Figure 1. Location of Mingo National Wildlife Refuge; Puxico, MO.

The Refuge System's Mission is to:

- Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered.
- Develop and maintain a network of habitats for migratory birds, anadromous and interjurisdictional fish, and marine mammal populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges.
- Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered.
- Provide and enhance opportunities to participate in compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and environmental education and interpretation).
- Foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.

### Mingo National Wildlife Refuge Purposes and Objectives:

Beginning in 1944, land was acquired for Mingo NWR with the approval of the Migratory Bird Conservation Commission. The purpose of the refuge derives from the Migratory Bird Conservation Act, "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. 715d). In acquiring the first tract for the refuge, the land was identified as "urgently needed for the protection and conservation of migratory waterfowl and other wildlife." In a 1954 presentation to the Migratory Bird Conservation Commission, the refuge was described as an "important unit in the Mississippi Flyway" and "an important wintering ground for many species of waterfowl."

One tract of the refuge was acquired with Bureau of Outdoor Recreation funds. The purpose associated with this funding derives from the Refuge Recreation Act and includes lands "...suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." 16 U.S.C. 460k-1 (Refuge Recreation Act (16 U.S.C. 460k-460k-4), as amended).

An additional purpose was acquired when Congress designated the 7,730 acre Mingo Wilderness in 1976. The establishing legislation for the Wilderness (Public Law 94-557) states that "wilderness areas designated by this Act shall be administered in accordance with the applicable provisions of the Wilderness Act...." The purposes of the Wilderness Act are additional purposes of that part of the refuge that is within the Mingo Wilderness. The purposes of the Wilderness Act are to secure an enduring resource of wilderness, to protect and preserve the wilderness character of areas within the National Wilderness Preservation System (NWPS), and to administer the NWPS for the use and enjoyment of the American people in a way that will leave these areas unimpaired for future use and enjoyment as wilderness.



## Operational Goals:

The refuge developed a Comprehensive Conservation Plan (CCP) to provide a 15 year management plan that is consistent with Service policy and legal mandates. The CCP was completed in 2007 and established new operational goals and objectives for wildlife, habitat, and public use. All recreational activities are secondary to the primary purpose for which the refuge was established. Uses identified in the *National Wildlife Refuge Improvement Act of 1997* (hunting, fishing, wildlife observation and photography, interpretation, and environmental education) receive special recognition by the Service and are accommodated when compatible with the original purpose of the refuge as a resting and wintering area for migratory waterfowl and other migratory birds. Connecting people with nature while conserving, managing, and restoring refuge lands and waters has been identified in the 2011 *USFWS Conserving the Future* document. Offering public vehicle access on the Ozark Highlands ATR contributes to the strategies identified in the Mingo NWR CCP.

### 1.4 Purpose

The Refuge proposes to continue allowing public vehicle access on the western edge of the Ozark Highlands ATR, but to alter the current route to better suit refuge maintenance and management needs and public use.

### 1.5 Need for Proposed Action

The proposed action is to offer public vehicle access on a proposed route that will remain open from March 1 through November 30 and for selected events from December 1 through the end of February.

Currently, the 14 mile Ozark Highlands ATR starts at the Spillway and travels west and north to Ditch 6 where it then turns south on Ditch 6 to Flat Banks. The route is currently open 4 months of the year: April, May, October, and November and for one week in August which coincides with Puxico Homecoming. The proposed route will revert back to the original ATR, which was in place before the current route. The proposed route is 15 miles and will start at the Spillway and travel north to Ditch 3. Rabbit Ridge or McGee Gate Road may be offered as an alternative exit route in case of excessive rainfall, maintenance, or management issues.

The proposed route will increase public safety, increase wildlife observation and photography opportunities, allow the refuge to provide better road maintenance, reduce impacts to migrating reptiles, and increase the length of time the route is open to the public. This timeframe will reduce waterfowl disturbance during key times of the year. The ATR may be temporarily closed for refuge maintenance or management needs during this timeframe.

The current route down Ditch 6 has resulted in high reptile mortality as indicated from annual road mortality first conducted annually since 2008. High mortality rates occurred during peak spring and fall reptile migrations, which coincide with the timeframe that the current route is open in April, May, October, and November. By altering the route to bypass Ditch 6, it is expected that reptile mortality would be reduced in a sensitive area.



### 1.6 Decision to be made:

This EA will include an evaluation of the environmental effects of the action alternatives and provide information to help the Refuge fully consider environmental impacts. Using the analysis in this EA, the Refuge will decide whether there would be any significant effects associated with the alternatives that would require the preparation of an environmental impact statement or whether the Proposed Action should be adopted.

### 1.7 Regulatory Compliance:

This EA was prepared by the Refuge and represents compliance with applicable Federal statutes, regulations, Executive Orders, and other compliance documents, including the following:

- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996).
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470).
- Clean Air Act of 1972, as amended (42 U.S.C. 7401 *et seq.*).
- Clean Water Act of 1972, as amended (33 U.S.C. 1251 *et seq.*).
- Endangered Species Act of 1973, (ESA) as amended (16 U.S.C. 1531 *et seq.*).
- Executive Order 12898, Federal Action Alternatives to Address Environmental Justice in Minority Populations and Low Income Populations, 1994.
- Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661 *et seq.*).
- Floodplain Management (Executive Order 11988).
- National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*).
- Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500 *et seq.*).
- National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 *et seq.*).
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 *et seq.*).
- Protection and Enhancement of the Cultural Environment (Executive Order 11593).
- Protection of Wetlands (Executive Order 11990).
- National Pollutant Discharge Elimination System, as amended (33 U.S.C. 1251 *et seq.*).

Further, this EA reflects compliance with applicable State of Missouri and local regulations, statutes, policies, and standards for conserving the environment and environmental resources such as water and air quality, endangered plants and animals, and cultural resources.

## 2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section explains how alternatives were formulated, describes alternatives, identifies the preferred alternative, and alternatives that were considered but not analyzed.

This EA evaluates the environmental consequences of public vehicle access on the Ozark Highlands ATR. Three alternatives are presented: A) No Action Alternative – allow public vehicle access on Ditch 6 for 4 months of the year; B) allow public vehicle access on Ditch 3 for 9 months of the year and as needed for special events from December 1 to the end of February (preferred alternative); or C) allow public vehicle access on Ditch 3 during the same 4 months of the year as currently offered.

Factors considered in the development of the alternatives were:

1. Compatibility with the purpose of the refuge and the mission of the National Wildlife Refuge System.
2. Natural resources of the refuge.
3. Demands and expectations of public safety.

**2.1 Alternative A—No Action—Under the No Action alternative, the USFWS would not change the current route or timeframe. Public vehicle access would be allowed to travel from the Spillway west and north to Ditch 6 during April, May, October, November, and one week during Puxico Homecoming in August (Figure 2).**

Under this alternative, Ditch 6 road would continue to deteriorate due to vehicle traffic and may become unsafe for public travel. Ditch 6 road is narrow and sits upon a levee making it hard to maintain for public use. The current route down Ditch 6 has resulted in high reptile mortality as indicated from annual road mortality surveys conducted since 2008. High mortality rates occurred during peak spring and fall reptile migrations, which coincide with the timeframe that the current route is open in April, May, October, and November.

This alternative would prevent the refuge from fulfilling the strategies outlined in the Mingo NWR CCP to “...offer seasonal vehicle access from March 1 through November 30 except for closure during State firearm deer season and as needed during reptile and amphibian migrations...and to provide wildlife observation and photography east of Ditch 6 to the eastern refuge boundary...and to open auto tour route for selected events during winter months (December 1 to end of February).” In addition, there are anticipated additional economic and societal benefits associated with the Preferred Alternative that would not occur under the No Action alternative.

**2.2 Alternative B—Preferred Alternative—Under the Preferred Alternative, the USFWS would allow public vehicle access on Ozark Highlands Auto Tour Route from the Spillway to Ditch 3 and connecting to the Sand Blow Ridge Road, which are all existing roads. The route would be open from March 1 through November 30 and for selected events during winter months (December 1 to end of February) (Figure 3).**

Under this alternative, it is expected that public safety would improve, refuge interpretation would improve, and wildlife viewing and photography opportunities would increase. Increased visitor use to view this popular route may provide an economic boost to the local economy.

The Preferred Alternative would also allow people to more easily access Fox Pond for fishing and wildlife viewing. The road to Fox Pond is currently open to vehicle access from May 15 through September 30. Special events and management needs (e.g., Eagle Days, Managed

Hunts) during the winter months may result in the ATR being opened temporarily from December 1 to the end of February under this alternative.

The ATR may also be temporarily closed for refuge maintenance or management needs and/or Rabbit Ridge or McGee Gate Road may be offered as an alternative exit route in case of excessive rainfall, maintenance issues or during waterfowl hunting season under this alternative.

**2.3 Alternative C—Allow public vehicle access on Ozark Highlands Auto Tour Route from Spillway to Ditch 3 (Figure 3) and connecting to Sand Blow Ridge Road for four (4) months of the year: April, May, October, November, and one week during Puxico Homecoming in August.**

Under Alternative C, the ATR would allow public vehicle access on the same route as aforementioned in Alternative B (Figure 3) with the exception that public vehicle access would only be allowed four (4) months of the year: April, May, October, November, and for one week during Puxico Homecoming in August. This timeframe is the same as that currently being offered under the No Action alternative. This alternative would partially satisfy what has been identified in the Mingo NWR CCP allowing more wildlife viewing and photography opportunities from March 1 through November 30 or temporarily from December 1 through the end of February.

**2.4 Alternatives considered but not analyzed:**

1. Allow public vehicle access on Ozark Highlands ATR from Spillway to Ditch 6 for nine (9) months from March 1 through November 30 and for selected events during the winter months (December 1 through February).
  - a. This alternative was not analyzed because it would require more road maintenance on Ditch 6 and would result in unsafe travel conditions for the public. This option would not allow for more public access in other areas of the refuge and would limit wildlife viewing opportunities that would be available elsewhere. Ditch 6 is a sensitive area for migrating reptiles from spring through fall, and increased vehicle traffic has the potential to increase reptile mortality if opened for longer periods.
2. Allow public vehicle access on Ozark Highlands ATR from Spillway through McGee Gate Road (bypass Ditch 3) for nine (9) months from March 1 through November 30 and for selected events from December 1 through end of February.
  - a. This alternative was not analyzed because it would cause an increased flow of traffic through the small town of McGee. The road and bridge infrastructure may not be able to handle the higher capacity resulting from this alternative. This route would also direct many visitors away from the refuge. This proposed exit from McGee back to the Refuge Visitor Center entrance is 16 miles off the Refuge.



Mingo National Wildlife Refuge  
Stoddard and Wayne Counties

**Ozark Highlands Auto Tour Route  
Environmental Assessment:  
Alternative A (No Action)**

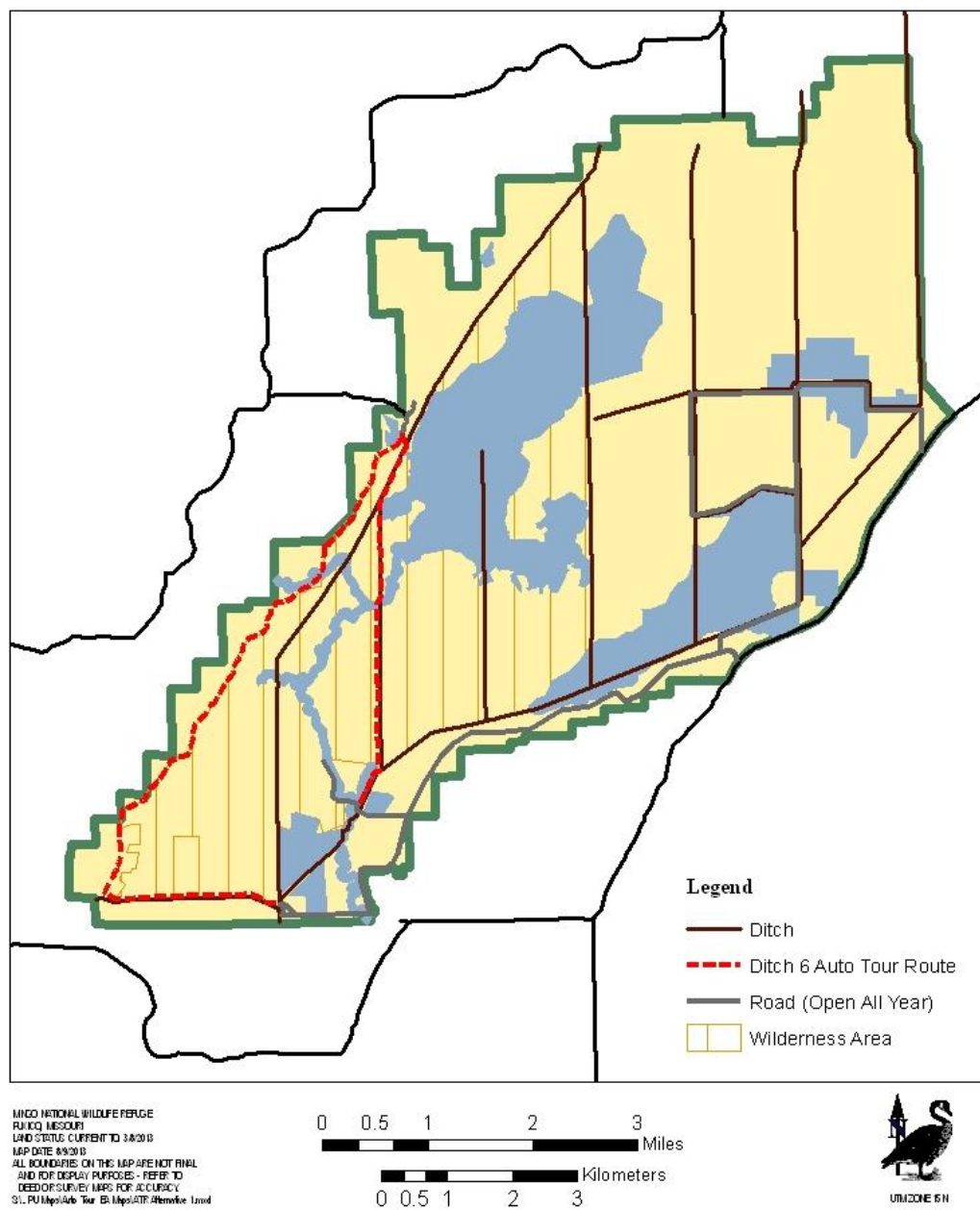


Figure 2. Alternative A –No Action. The auto tour route will not change from what is currently offered.



**Mingo National Wildlife Refuge**  
Stoddard and Wayne Counties

**Ozark Highlands Auto Tour Route  
Environmental Assessment:  
Alternative B (Preferred Action) &  
Alternative C**

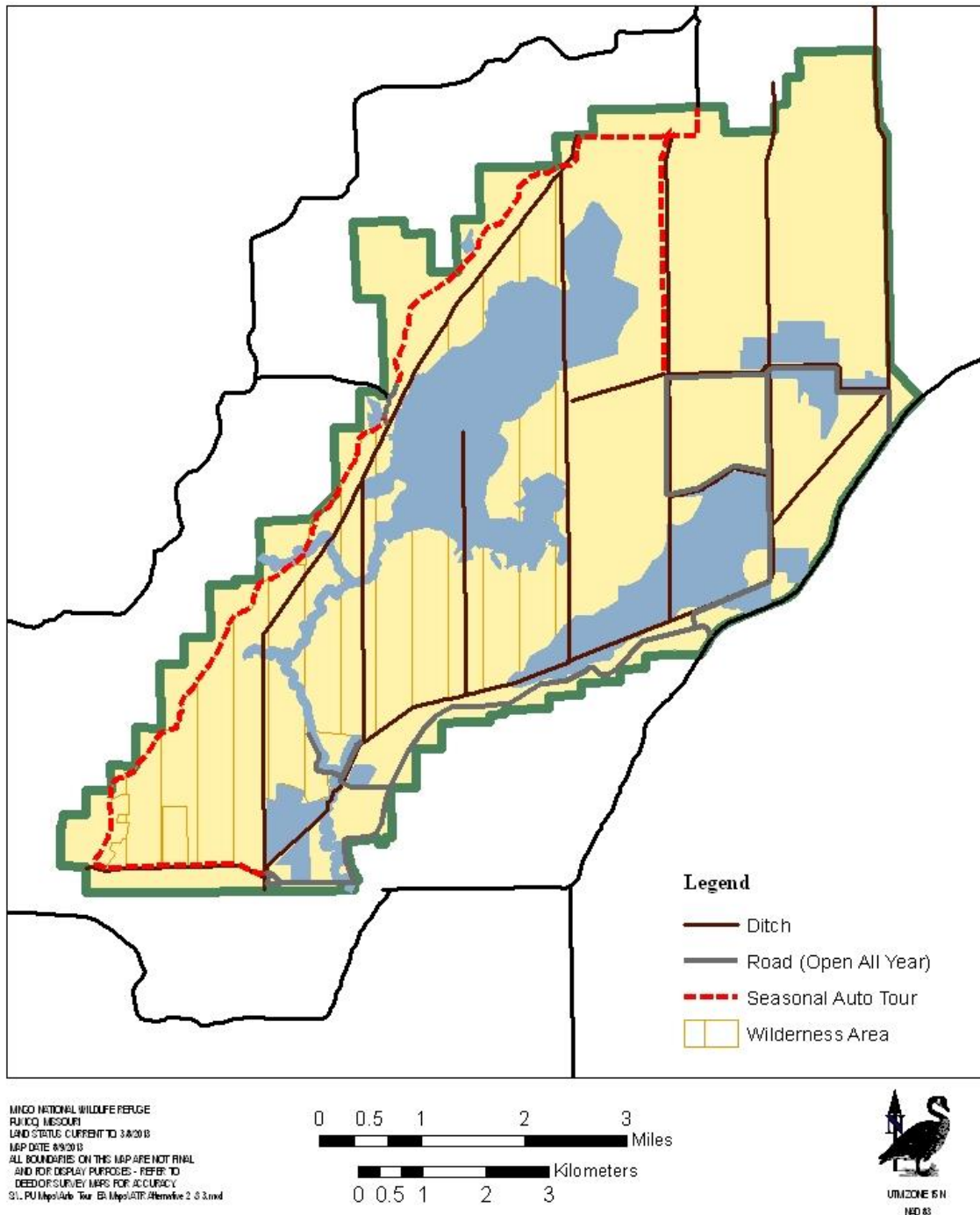


Figure 3. Alternative B and C route location. For Alternative B and C, the auto tour route will bypass Ditch 6 and follow Ditch 3 connecting to Sand Blow Ridge Road with different open dates for each alternative.

## **3.0 AFFECTED ENVIRONMENT**

### **3.1 Physical Environment**

Mingo National Wildlife Refuge protects a remnant of the bottomland hardwood and cypress-tupelo swamp ecosystem that once formed a 2.5 million-acre contiguous natural landscape throughout the Mississippi River basin. The 21,592-acre refuge represents the largest contiguous habitat complex for numerous native and threatened plant and animal species remaining in southeast Missouri. The refuge touches the southeast boundary of the Ozark Plateau and slopes abruptly from an upland oak-hickory forest to bottomland hardwood forest, lower marsh, and expansive swamp and ditch system. Since the beginning of the 20th century, these lands have been drained and deforested for agricultural purposes, which has highly modified the natural landscapes and ecosystem functions.

Mingo National Wildlife Refuge lies at the northern tip of the Lower Mississippi River Ecosystem where it meets the Ozark Plateau Ecosystem. The forested wetlands found across the Mingo basin are characteristic of the Lower Mississippi River Ecosystem, while the upland forests found along the bluffs are characteristic of the Ozark Plateau Ecosystem.

The Lower Mississippi River Ecosystem was a 25-million-acre complex of forested wetlands that extended along both sides of the Mississippi River from Illinois to Louisiana. The extent and duration of seasonal flooding from the Mississippi River fluctuated annually, recharging aquatic systems and creating a diversity of dynamic habitats that supported a vast array of fish and wildlife. Today less than 20 percent of the bottomland hardwood forest remains and most is fragmented or in scattered patches throughout the region.

#### **3.1.1 Water Resources:**

Accumulation, movement, and drainage of water drive the ecology of Mingo NWR. The refuge is within the lower portion of the St. Francis River basin, and acts as a reservoir during periods of flooding. Water enters from all directions until runoff is complete and water levels stabilize. Water flow within the refuge is complex and varies depending on water depths within each of the pools. Poor drainage within the basin is slowed further by the dikes, levees, and ditches across the refuge. Water exits the refuge and flows south to the St. Francis River.

The St. Francis River flows 225 miles from Iron County in Missouri to the Arkansas/Missouri border, and another 207 miles through Arkansas until it joins with the Mississippi River. Hydrology of the St. Francis River and entire Bootheel region has been drastically altered. Extensive networks of ditches and levees drain the floodplain, and control seasonal flooding.

#### **3.1.2 Soils / Landforms / Geology:**

The most extensive soil type is Waverley Silt Loam, with a grayish brown silt loam surface layer and gray silt loam subsoil that is mottled throughout. A poorly drained acidic soil formed under wet conditions and a high water table, it occupies approximately 50 to 60 percent of the refuge.

Falaya Silt Loam occupies a small part of the bottom in areas such as Stanley Creek and Lick Creek. It also borders the upland and the channel of Mingo Creek. Falaya soils have brown silt loam surface layers over grayish brown silt loam underlain at about 40 inches by frayed silty clay loam. This soil is somewhat poorly drained, acidic, and subject to flooding or ponding. Organic soils occupy 800 to 900 hundred acres in Rockhouse and Monopoly marshes and consist of dark colored soils derived from organic matter. They were formed under wet marshy conditions in some of the lowest elevations.

## 3.2 Biological Resources/Environment

### 3.2.1 Vegetative Communities

With the exception of the bluffs on either side of the refuge, most of the area is subject to seasonal flooding and is wet during at least a portion of each year. Vegetation varies along a narrow elevation gradient that corresponds to duration of flooding. Four community types are delineated within the refuge based on dominant species, elevation, and inundation.

**Terrace Bottoms Community** – Terrace or second bottoms are located at the base of lower slopes, flat banks, and watercourse margins. These well-drained and rarely flooded transitional areas support a mixture of upland and flood plain woody species. Species include: Sugar Maple (*Acer saccharum*), Northern Red Oak (*Quercus rubra*), Shagbark Hickory (*Carya ovata*), Bitternut Hickory (*Carya cordiformis*), Sweetgum (*Liquidambar styraciflua*), American Elm (*Ulmus americana*), Hackberry (*Celtis occidentalis*).

**Oak Hardwood Bottoms Community** – The most extensive bottomland forest type is the Oak Hardwood Bottoms. These Pin Oak flats occupy shallowly inundated areas along the banks between drainage ditch levees, and the low floodplains surrounding Rockhouse and Monopoly Marshes. Species include: Pin Oak (*Quercus palustris*), Willow Oak (*Quercus phellos*), Overcup Oak (*Quercus lyrata*), Green Ash (*Fraxinus pennsylvanica* var. *subintegerrima*), Slippery Elm (*Ulmus rubra*), and Persimmon (*Diospyros virginiana*).

**Mixed Soft-Hardwood Levees Community** – This community type exists along drainage ditch levees, stream margins, roadside embankments, and other watercourse borders. Species include: Black Willow (*Salix nigra*), Cottonwood (*Populus deltoides*), Silver Maple (*Acer saccharinum*), Sycamore (*Platanus occidentalis*), and River Birch (*Betula nigra*).

**Shallow Swamp Community** – This community type occupies inundated areas such as Monopoly Marsh, Rockhouse Marsh, Mingo Creek, and Stanley Creek. Species include: Bald Cypress (*Taxodium distichum*), Swamp Blackgum (*Nyssa sylvatica* var. *biflora*), Swamp Cottonwood (*Populus heterophylla*), Red Maple (*Acer rubrum*), Pumpkin Ash (*Fraxinus tomentosa*), Black Willow, Water Locust (*Gleditsia aquatica*), Green Ash, Water Hickory (*Carya aquatica*).

### 3.2.2 Wildlife

A total of 279 resident and migratory bird species use refuge habitats throughout each year. Tens of thousands of Mallards, Canada Geese, and other migrating waterfowl use refuge wetlands as stopover or wintering habitat. Hooded Mergansers and Wood Ducks are resident breeders on the



refuge. Monopoly Marsh draws Wood Ducks from a five-state area during molting season. Bald Eagles, Least Bitterns, and Mourning Doves are among the 108 bird species that regularly breed on the refuge.

Thirty-eight mammal species are found within the refuge. White-tailed deer, a species popular for hunting and viewing, are abundant at a population density of up to 35 per square mile. There is a wide diversity of small mammals including three species of squirrels, many species of bats, and various mice, rats, and voles. The refuge is one of the few places in Missouri where the swamp rabbit, a larger relative of the eastern cottontail rabbit, is known to occur. Unlike other rabbits, the swamp rabbit regularly takes to the water to move about and avoid predators.

Amphibians and reptiles are abundant on the refuge with more than 30 species of frogs, toads, salamanders, and snakes including the venomous western cottonmouth, southern copperhead, and timber rattlesnake. Many of these species hibernate within the cracks and crevices of the bluffs along the perimeter of the refuge.

At least 46 species of fishes, including channel catfish, white crappie, spotted bass, and green sunfish, are known to occur in the ponds and ditches of the refuge.

### 3.2.3 Threatened and Endangered Species

Special status species found within the project area that are listed as being either *threatened* (T), *endangered* (E) or as *candidates* (C) for being listed include: Indiana bat (*Myotis sodalis*).

## 3.3 Socioeconomic Considerations

### 3.3.1 Cultural Resources/Environment

The refuge has completed archeological surveys for almost 7,200 acres on the refuge, including the Mingo Job Corps campus prior to its transfer to the U.S. Forest Service. The surveys and other sources have identified more than 140 cultural resource sites on the refuge. Recorded archeological sites on the refuge represent all Midwest United States cultural periods from the earliest Paleo-Indian through 20th century Western, a period of about 12,000 years.

Nevertheless, evidence shows no human presence in the refuge and vicinity at the time Europeans first entered the region. One standing structure on the refuge, the Patrol or Sweet's Cabin from the early 20th century, is representative of Depression era homesteads in the region; it is historically significant and may be eligible for the National Register. As of September 2003, Stoddard and Wayne counties listed seven properties on the National Register of Historic Places. The refuge contains one of the National Register properties, the Mingo National Wildlife Refuge Archeology District.

The North American Consultation Database, run by the Park Service to assist Federal agencies responding to the requirements of the Native American Graves and Protection and Repatriation Act, lists no tribes with identified interests in Stoddard and Wayne counties. The database, however, is not a comprehensive list, being based on a limited number of legal sources. Cherokee, Choctaw, Creek, Delaware, Miami, Mingo (Iroquois), Osage, Quapaw, Seneca, and

Shawnee may have had limited historic period interest in the refuge area, the Chickasaw and Tunica may have had protohistoric period interest, and the antecedent Pawnee and Wichita may have had prehistoric interest. Other interest groups that might have a cultural resources concern about the refuge have not yet been identified.

Cultural resources are important parts of the nation's heritage. The Service preserves valuable evidence of human interactions with each other and the landscape. Protection is accomplished in conjunction with the Service's mandate to protect fish, wildlife, and plant resources.

### 3.3.2 Economic/Public Use/Recreation/Wilderness

The refuge is tied to the local economy largely through the public's use of the refuge for recreational opportunities. In general, as described in the CCP and Visitor Services Plan, public uses include: hunting, fishing, a combination of hiking and auto interpretive trails, wildlife viewing and photography areas, environmental education stations, visitor center with exhibits, and special seasonal wildlife programs.

A nationwide analysis of selected units of the Refuge System focused on the regional economic effects of recreational visitors to refuges. Titled *Banking on Nature* (USFWS 2005), the report included a summary of the total economic impacts associated with Mingo visitor spending. Total final demand in 2004 was \$872,100. This is the total monetary value of economic activity generated in the 2-county area by refuge visitor spending. In turn, this final demand generated 12 jobs (both full-time and part-time) with total job income of \$242,400. Total tax revenue generated (county, state and Federal) amounted to \$97,900.

In 2012, an estimated 116,000 visitors came to explore Mingo NWR. In 2012, 61,053 wildlife observation visits occurred with peak visits during the waterfowl migration periods in the spring and fall. The Ozark Highlands ATR (April, May, October, November and one week for Puxico Homecoming in August) and Red Mill ATR (open year round) received approximately 53,723 vehicle visits (8,203 vehicles and 45,520 vehicles, respectively). Of the total number of visitors, approximately 6,168 photography visits, 4,662 fishing visits, and 2,631 hunting visits occurred on the refuge. Other uses include environmental education, interpretation, hiking, horseback riding, and biking. To formulate public use on Mingo NWR, the refuge has a number of traffic and pedestrian counters strategically placed at popular destinations to help count and extrapolate the number of visits to the refuge, as well as OMB-approved hunter survey collection cards to keep track of the number of hunting visits.

Congress designated the western portion (7,730 acres) of the Refuge as the Mingo Wilderness Area in 1976. In 1964, Congress passed and the President signed the Wilderness Act, which established the National Wilderness Preservation System. The legislation set aside certain federal lands as wilderness areas. The act says that they are areas, "...where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain."

Wilderness policy permits hiking, backpacking, fishing, wildlife observation, and environmental education and interpretation. It generally prohibits motorized activities, although tools like chainsaws may be used in wildland fire management, after a MIST (Minimum Impact Suppression Tactics) analysis. Ditches, roads and levees, specifically excluded from Wilderness

designation, help approximate water level fluctuations that once happened naturally and allow for maintenance and access.

## 4.0 Environmental Consequences (Alternatives A, B, and C)

This section reviews and documents the potential direct, indirect, and cumulative effects that implementation of each of the alternatives described in Section 2.0 of this EA would likely have upon the physical, biological, and social aspects of the human environment (as described in Section 3.0 of this document).

**Direct effects** are considered to be impacts that would be caused by the alternative at the same time and place as the action, whereas **indirect effects** are impacts that occur later in time or at a distance from the triggering action. **Cumulative effects** are incremental impacts that result from other past, present, and reasonably foreseeable future actions, including those taken by federal and non-federal government agencies, as well as those undertaken by private groups and individuals. Cumulative impacts may result from singularly minor but collectively significant actions taking place over a period of time.

### 4.1 Effects to Physical Environment

#### 4.1.1 Water Resources—Discussion of Direct and Indirect Effects

##### Alternative A—No Action:

There are no additional expected short-term or long-term direct or indirect effects to water resources associated with this alternative. Public vehicle usage on this route has occurred in the past and has shown that vehicle traffic impact on the hydrology of the Refuge would be negligible and impacts to water quality would be minimal with no additional impacts above current levels.

##### Alternative B—Preferred Alternative:

There may be some direct or indirect effects to water resources associated with this alternative. Refuge staff expect that vehicle traffic impact on the hydrology of the Refuge would be negligible, and impacts to water quality would be minimal. Additional traffic expected from this alternative may potentially increase the source of pollutants into the waterways due to leaking or spillage from vehicles. This potential impact is expected to be negligible under this alternative.

##### Alternative C—

There are no expected short-term or long-term direct or indirect effects to water resources associated with this alternative. Refuge staff expect that vehicle traffic impact on the hydrology of the Refuge would be negligible, and impacts to water quality would be minimal. Additional traffic expected from this alternative may potentially increase the source of pollutants into the waterways due to leaking or spillage from vehicles. This potential impact is expected to be negligible under this alternative.

#### 4.1.2 Soil\Landforms\Geology—Discussion of Direct and Indirect Effects

##### Alternative A—No Action:

There are no expected additional short-term or long-term direct or indirect effects to the soil, landforms, or geology with this alternative. Vehicle traffic would be traveling over substrate that has already been approved for traffic on gravel or asphalt and is already part of the ATR.

##### Alternative B—Preferred Alternative:

There are no expected additional short-term or long-term direct or indirect effects to the soil, landforms, or geology with this alternative. Vehicle traffic would be going over substrate that has already been approved for Refuge vehicle use.

##### Alternative C—

There are no expected additional short-term or long-term direct or indirect effects to the soil, landforms, or geology with this alternative. Vehicle traffic would be going over substrate that has already been approved for traffic on gravel or asphalt.

### 4.2 Biological Resources/Environment

#### 4.2.1 Vegetative Communities—Discussion of Direct and Indirect Effects:

##### Alternative A—No Action:

There are no expected additional short-term or long-term direct or indirect effects to the vegetation community associated with this alternative. Public vehicle usage on this route has occurred in the past and has shown that vehicle traffic impact on the vegetation would be negligible as vehicles are restricted to the road. As the ATR attracts visitors, there may be an increase in the number of people who stop to hike which will increase the negative impact on vegetation from walking and/or may be a source for invasive plant species. The impacts of walking in the woods would have a negligible effect on the vegetation community since the activity can be spread over a large area. Minor roadside maintenance would occur to keep areas clear but does not impact vehicle usage.

##### Alternative B—Preferred Alternative:

Some direct or indirect effects to the vegetation community associated are potentially associated with this alternative. Refuge staff expect that vehicle traffic impact on the vegetation would be negligible as vehicles are restricted to the road. As the ATR attracts additional visitors, there may be an increase in the number of people that will stop to hike which may increase the negative impact on vegetation from walking and/or may be a source for invasive plant species. The impacts of walking in the woods would have a negligible effect on the vegetation community since the activity can be spread out over a large area. Minor roadside maintenance would occur to keep areas clear but does not impact vehicle usage.

## Alternative C—

Some direct or indirect effects to the vegetation community associated are potentially associated with this alternative. Refuge staff expect that vehicle traffic impact on the vegetation would be negligible as vehicles are restricted to the road. As the ATR attracts additional visitors, there may be an increase in the number of people who stop to hike which may increase the negative impact on vegetation from walking and/or may be a source for invasive plant species. The impacts of walking in the woods would have a negligible effect on the vegetation community since the activity can be spread out over a large area. Minor roadside maintenance would occur to keep areas clear but does not impact vehicle usage.

### 4.2.2 Fish and Wildlife--Discussion of Direct and Indirect Effects:

#### Alternative A—No Action:

Under this alternative, direct impacts are still expected from vehicle traffic on large and small mammals, birds, reptiles, amphibians and other wildlife being struck while crossing the road. Visitors can access the Ozark Highlands ATR by vehicle during April, May, October, November, and one week in August during Puxico Homecoming, which coincide with spring and fall amphibian and reptile migration. From the refuge's annual road snake mortality surveys, Ditch 6 is recognized as a major migration corridor and is a sensitive area between marsh, bottomland, and upland habitats. The possible continued impact to amphibian and reptile numbers is not expected to be enough to affect the area's overall amphibian and reptile populations. Refuge staff will continue to monitor road mortality to see if it warrants change in the future.

Other impacts to wildlife from this alternative may include noise, dust or disturbance from vehicle traffic. A less likely direct impact may be from poaching wildlife along the ATR. Under this No Action alternative, these impacts are expected to remain the same as current conditions.

Waterfowl disturbance would be kept at minimum under this No Action alternative. Waterfowl are known to congregate in Monopoly Marsh, Rockhouse Marsh, greentree reservoirs, and refuge moist soil units. Spring migration occurs from mid-January through early April and fall migration from mid-September through December with peak activity from October 1 to March 1. Waterfowl disturbance could occur from human activity on the edges of flooded habitat that are adjacent to the road, specifically the area adjacent to the Ditch 6 road. With the ATR closing November 30, there would be no long-term effects on waterfowl in flooded habitat. Under the No Action alternative, public uses that occur on the refuge would be segregated by location and time of year to minimize disturbance in these areas during peak migration activity, while still catching a glimpse of waterfowl activity during April, May, October, and November.

#### Alternative B—Preferred Alternative:

Under this alternative, some direct impact is expected from vehicle traffic on large and small mammals, birds, reptiles, amphibians and other wildlife being struck while crossing the road.

Ditch 6 road is recognized as a major migration corridor and is a sensitive area between marsh habitat, bottomland habitat, and upland habitat. Ditch 6 road has shown a high potential for reptile mortality due to vehicle collisions. Eliminating this road in the Preferred Alternative should decrease reptile mortality. The possible decline in amphibian and reptile numbers from the preferred route and timing is not expected to be enough to affect the area's overall amphibian and reptile populations. A decrease in overall vehicle mortality is expected on the Refuge by removing Ditch 6 access under this alternative. Refuge staff will continue to monitor road mortality to see if it warrants change in the future.

Other impacts to wildlife from this alternative may include noise, dust or disturbance from vehicle traffic. These are expected to be similar to current conditions. A less likely direct impact may be from poaching wildlife along the ATR. Under this alternative, these impacts are expected to remain very similar to current conditions.

Waterfowl disturbance would be kept minimal under this alternative. Waterfowl are known to congregate in Monopoly Marsh, Rockhouse Marsh, greentree reservoirs, and refuge moist soil units. Spring migration occurs from mid-January through early April and fall migration from mid-September through December with peak activity from October 1 to March 1. March 1 through November 30 is relatively the same timeframe allowed to see waterfowl activity as it is under the No Action alternative, with the exception of being able to see March and mid-September migrations and wood duck and hooded merganser brood production in the spring and summer. For special events from December 1 through February (e.g., Eagle Days, Managed Hunts) the ATR may be opened temporarily to allow public access. Waterfowl disturbance would be kept minimal since disturbance is limited to the edges of flooded habitat that are adjacent to the road. Under the Preferred Alternative, public uses that occur on the refuge would be segregated by location and time of year to minimize disturbance in these areas during peak migration activity, while still catching a glimpse of waterfowl activity during the spring and fall and wood duck and hooded merganser brood production from spring through summer.

#### Alternative C—

Under this alternative, some direct impact is expected from vehicle traffic on large and small mammals, birds, reptiles, amphibians and other wildlife being struck while crossing the road. Visitors can access the Ozark Highlands ATR by vehicle during April, May, October, November, and one week in August during Puxico Homecoming, which coincide with the spring and fall migration of amphibians and reptiles.

Other indirect impacts to wildlife from this alternative may include noise, dust or disturbance from vehicle traffic. These are expected to be similar to current conditions. A less likely direct impact may be from poaching wildlife along the ATR. Under this alternative, these impacts are expected to remain very similar to current conditions.

Ditch 6 road is recognized as a major migration corridor and is a sensitive medium between marsh habitat, bottomland habitat, and upland habitat. Ditch 6 road has shown a high potential for reptile mortality due to vehicle collisions. Eliminating this road from this alternative should decrease reptile mortality. The possible decline in amphibian and reptile numbers from this

route and timing is not expected to be enough to affect the area's overall amphibian and reptile populations. A decrease in overall vehicle mortality is expected on the Refuge by removing Ditch 6 access under this alternative. Refuge staff will continue to monitor road mortality to see if it warrants change in the future.

Waterfowl disturbance would be minimal under this alternative. Spring migration occurs from mid-January through early April and fall migration from mid-September through December with peak activity from October 1 to March 1. Waterfowl are known to congregate in Monopoly Marsh, Rockhouse Marsh, greentree reservoirs, and refuge moist soil units. Under this alternative, public uses that occur on the refuge would be segregated by location and time of year to minimize disturbance in these areas during peak migration activity, while still catching a glimpse of waterfowl activity during April, May, October, and November.

#### 4.2.3 Threatened and Endangered Species—Discussion of Direct and Indirect Effects:

##### Alternative A—No Action:

It is anticipated that there would be no direct impact to threatened and endangered species with this alternative. This is a public use activity that requires no ground disturbance. A Section 7 Biological Assessment has determined there would be no direct or indirect effect to the Indiana bat from this action.

##### Alternative B—Preferred Alternative:

It is anticipated that there would be a no direct impact to threatened and endangered species with this proposed action. This is a public use activity that requires no ground disturbance. A Section 7 Biological Assessment has determined there would be no direct or indirect effect to the Indiana bat from this action.

##### Alternative C—

It is anticipated that there would be a no adverse direct impact to threatened and endangered species with this alternative. This is a public use activity that requires no ground disturbance. A Section 7 Biological Assessment has determined there would be no direct or indirect effect to the Indiana bat from this action.

#### 4.3 Socioeconomic Effects:

##### 4.3.1 Cultural Resources/Environment—Discussion of Direct and Indirect Effects:

##### Alternative A—No Action:

The Refuge has conducted a cultural resources survey of the project area to better define any potential impacts to these important resources. Under this alternative, there are no anticipated additional direct or indirect impacts to the cultural environment, as current conditions would be maintained, and soil disturbance would occur over the existing roadway. A finding of “no



effect” on historical or archaeological resources on the roadway on the Section 106 of the National Historic Preservation Act was obtained from the Service and State Historic Preservation Officers. Potential collection or removal of cultural artifacts are prohibited and subject to criminal prosecution.

#### Alternative B—Preferred Alternative:

The Refuge has conducted a cultural resources survey of the project area to better define any potential impacts to these important resources. Under the Preferred Alternative, there are no anticipated additional direct or indirect impacts to the cultural environment, as current conditions would be maintained, and soil disturbance would occur over the existing roadway. A finding of “no effect” on historical or archaeological resources on the roadway on the Section 106 of the National Historic Preservation Act was obtained from the Service and State Historic Preservation Officers. Potential collection or removal of cultural artifacts are prohibited and subject to criminal prosecution.

#### Alternative C—

The Refuge has conducted a cultural resources survey of the project area to better define any potential impacts to these important resources. Under the Preferred Alternative, there are no anticipated additional direct or indirect impacts to the cultural environment, as current conditions would be maintained, and soil disturbance would occur over the existing roadway. A finding of “no effect” on historical or archaeological resources on the roadway on the Section 106 of the National Historic Preservation Act was obtained from the Service and State Historic Preservation Officers. Potential collection or removal of cultural artifacts are prohibited and subject to criminal prosecution.

### 4.3.2 Economic/Public Use/Recreation/Wilderness—Discussion of Direct and Indirect Effects:

#### Alternative A—No Action:

The current economic role that the refuge plays in the local economy would continue. There would be no immediate changes expected regarding wildlife viewing opportunities. The No Action alternative would be expected to have direct impacts in the short-term as the spring and fall months are popular times for people to visit Mingo NWR and drive the ATR while viewing wildlife, nature, and taking photographs. A minor, negative direct effect would be that the ATR may be temporarily closed to the public during refuge managed hunt(s). In the long-term, the new Visitor Center would attract more visitors to Mingo NWR and would increase economic impact for local businesses.

A direct impact to the Mingo Wilderness area from the No Action alternative would be the continued increased disturbance to the Wilderness Area along Ditch 6 road. The current route down Ditch 6 road travels through the Mingo Wilderness Area and is Wilderness on both sides.

#### Alternative B—Preferred Alternative:

The Preferred Alternative is anticipated to improve wildlife viewing and photography opportunities and increase recreational opportunities for fishermen, hunters, birdwatchers, and

other members of the public interested in a range of outdoor experiences offered by the refuge during nine (9) months of the year. A minor, negative direct effect would be that the ATR may be temporarily closed to the public during refuge managed hunt(s). Overall, this alternative is expected to result in a positive economic impact to the local area from increased visitation to the refuge by the public during this key time of the year. The new Visitor Center would also attract more visitors to Mingo NWR.

A direct impact to the Mingo Wilderness area from the preferred alternative would be the decrease in disturbance to the Wilderness Area by avoiding Ditch 6 road. The proposed route would avoid Ditch 6 completely and would create a buffer between the ATR and Ditch 10 along the Northern portion of the route. The route would then travel down Ditch 3 which is not part of the Wilderness Area. This is expected to reduce impacts to visitor's wilderness experience.

#### Alternative C—

This alternative is anticipated to improve wildlife viewing and photography opportunities and increase recreational opportunities for fishermen, hunters, birdwatchers, photographers, and other members of the public interested in the range of outdoor experiences offered by the refuge. A minor, negative direct effect would be that the ATR may be temporarily closed to the public during refuge managed hunt(s). Overall, this alternative could result in a positive economic impact to the local area from increased visitation to view more of the refuge during these four months of the year.

A direct impact to the Mingo Wilderness area from this alternative would be the decrease in disturbance to the Wilderness Area by avoiding Ditch 6 road. The proposed route would avoid Ditch 6 completely and would create a buffer between the ATR and Ditch 10 along the Northern portion of the route. The route would then travel down Ditch 3 which is not part of the Wilderness Area. This is expected to reduce impacts to visitor's wilderness experience.

#### 4.4 Summary of Environmental Consequences by Each Alternative:

The table below summarizes actions that are anticipated under each alternative for each environmental resource.

Table 1. Summary of Environmental Consequences by Each Alternative.

<b>Environmental Resource</b>	<b>Alternative A: No Action Alternative</b>	<b>Alternative B: Preferred Alternative</b>	<b>Alternative C:</b>
<b>Water Resources: Water management</b>	No impact	No impact	No impact
<b>Water Resources: Water quality</b>	Minor short-term negative impacts.	Minor short-term negative impacts.	Minor short-term negative impacts.
<b>Soils/Landforms/Geology</b>	No impact	No impact	No impact
<b>Biological Resources: Vegetation</b>	Minor short-term and long-term negative impacts.	Minor short-term and long-term negative impacts.	Minor short-term and long-term negative impacts.
<b>Biological Resources: Wildlife and Fish</b>	Major short-term and long-term negative impacts.	Minor short-term and long-term negative impacts.	Minor short-term and long-term negative impacts.
<b>Biological Resources: Special status species</b>	No impact	No impact	No impact
<b>Cultural and Historic Resources</b>	No impact	No impact	No impact
<b>Economic/Public Use/Recreation/Wilderness</b>	Moderate short-term and long-term positive impacts.	Major short-term and long-term positive impacts.	Moderate short-term and long-term positive impacts.

#### 4.5 Assessment of Cumulative Effects by Alternative

A cumulative impact is defined as an impact on the environment that results from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Cumulative impacts are the overall, net effects on a resource that arise from multiple actions. Impacts can “accumulate” spatially, when different actions affect different areas of the same resource. They can also accumulate over the course of time, from actions in the past, the present, and the future. Occasionally, different actions counterbalance one another, partially cancelling out each other’s effects on a resource. But more typically, multiple effects add up, with each additional action contributing an incremental impact on the resource.

#### Alternative A—No Action:

As detailed in the preceding analysis, it is anticipated that maintaining the current vehicle traffic and use of the wildlife viewing route through the No Action alternative would not meet the overarching goal of increasing public use through wildlife viewing and photography opportunities as outlined in the refuge CCP and Visitor Services Plan (VSP). The timeframe restricts public vehicle use to 4 months of the year; April, May, October, November, and one week during Puxico Homecoming in August.

Overall, there would be minimal impact to most of the environmental resources, other than minor direct negative impacts such as walking through the vegetation while hiking, weed introduction, potential poaching and pollutants from vehicles. All of these impacts are expected to be consistent with current levels. There would be continued substantial direct negative impacts to wilderness and migrating amphibians and reptiles on Ditch 6 during the spring and fall. There would be minor disturbance to waterfowl on the edge of flooded habitat during the spring and fall. It is not feasible for the refuge to continue to maintain Ditch 6 for vehicle traffic access. The road would continue to deteriorate and eventually cause public safety concerns.

#### Alternative B—Preferred Alternative:

It is expected that implementation of the Preferred Alternative would effectively address the objectives set forth through the refuge CCP and Visitor Services Plan, and offer improved recreational opportunities for refuge visitors. The original auto tour route once followed this same alignment before the current route was put into place.

Overall, there would be minimal impact to most of the environmental resources, other than minor direct negative impacts such as walking through the vegetation while hiking, weed introduction, potential poaching and pollutants from vehicles. There would be minimal disturbance to migrating amphibians and reptiles and waterfowl, as this route would bypass Ditch 6 through Monopoly Marsh. This route would remove disturbance from the Wilderness area by avoiding Ditch 6. Overall, the timing of peak viewing opportunities (March 1 through November 30) correlate with the timing of the No Action alternative with the exception of being able to view March and mid-September migrations and wood duck and hooded merganser brood production on the edge of flooded habitat in the spring and summer. The ATR may be open for special events (e.g., Eagle Days, Managed Hunts) from December 1 through the end of February, but these events are temporary and short-term with only minor disturbance to waterfowl expected on the edge of flooded habitat. The Preferred Alternative is expected to have a positive economic impact to the local area from increased visitation to the refuge by the public. It is expected that the Preferred Alternative would improve the refuge's ability to increase safe public use on Mingo NWR and to best utilize refuge resources, and infrastructure.

#### Alternative C—

As detailed in the preceding analysis, it is anticipated that maintaining the current open period under this alternative would not meet the overarching goal of increasing public use through wildlife viewing and photography opportunities as outlined in the refuge CCP and Visitor Services Plan. The auto tour route followed the proposed route before the current route was put

in place.

Overall, there would be minimal impact to most of the environmental resources, other than minor direct negative impacts such as walking through the vegetation while hiking, weed introduction, potential poaching, and pollutants from vehicles. There is minimal disturbance to waterfowl, as this route will bypass Ditch 6 through Monopoly Marsh and vehicle access would only be allowed in April, May, October, November and one week in August during Puxico Homecoming. The timing of peak viewing opportunities correlates with the timing of the No Action alternative. The new route outlined in the Preferred Alternative is expected to create a moderate positive economic impact to the local area from increased visitation to the refuge by the public. This positive effect is limited because the ATR would only be available to public vehicle access for 4 months of the year, plus one week during Puxico Homecoming. This alternative would partially meet the refuge's ability to increase visitor use on Mingo NWR in a safe manner for wildlife and infrastructure.

## **5.0 Environmental Justice**

No one group or Tribe represented in the community would be disproportionately impacted by allowing the public to access the ATR. Thus, Alternatives A, B, or C would not result in any environmental justice issues.

## **6.0 CONSULTATION, COORDINATION AND DOCUMENT PREPARATION**

A 30 day public comment for this document occurred from September 10, 2013 to October 9, 2013. A copy of this EA was placed at the Puxico Library and Mingo NWR Visitor Center. It was also posted on the Mingo NWR web and a notification of availability was placed on the Mingo NWR Facebook page and in the local newspaper.

### **6.1 Agencies and individuals consulted for the preparation of this document:**

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#### 6.2 Document Preparation:

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